

PHILIP MORRIS U. S. A.

I N T E R - O F F I C E C O R R E S P O N D E N C E

Richmond, Virginia

To: A. C. Lilly

Date: February 19, 1990

From: B. C. LaRoy

Subject: Technology Assessment Strategies & Tactics for 1990

OBJECTIVE OF TECHNOLOGY ASSESSMENT

Ensure that R&D maintains appropriate awareness, knowledge and expertise in strategic areas of science and technology which will be needed by Philip Morris USA in the future (5-15 years).

STRATEGIES & TACTICS

The strategies and tactics established in 1988 and outlined in last years plans¹ have been generally successful and, with a few changes, will be carried forward through 1990. Status was reviewed at the December, 1989 Planning Meeting². The discussion below will be restricted to specific tactical objectives for 1990.

STRATEGY I:

Develop and maintain a current assessment of strategic science and technology needs.

Tactics:

1. With the Technology Assessment Working Committee, identify the current strategic technology needs of PM USA Operations. Continue to develop and establish procedures by which the Committee can support the investigation, development and implementation of these technologies.
2. With the R&D Strategic Planning Committee, develop and establish procedures for better identifying the Strategic Science and Technology Needs of the R&D Programs.

STRATEGY II.

Develop and maintain current technical awareness of the broad bases of science and technology which may supply the above needs.

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Tactics:

1. Maintain current contacts with universities (Carnegie Mellon, Colorado State, Georgia Tech., N.Y. Polytechnic, Notre Dame, Seton Hall, University of Virginia, Virginia Commonwealth University, and Virginia Tech.) and companies (Stackpole, Stone, Coors, Sepracor, Pinnacle Research, and Motorola).
2. Establish new university and/or industrial contacts as appropriate. In particular, we will seek to expand our contacts in the areas of (1) catalysis, (2) adhesive mechanisms and (3) energy storage.
3. Determine the feasibility/advisability of establishing interactions with leading government supported laboratories (Sandia, Los Alamos). Establish such relationships if appropriate.
4. Establish procedures for working more effectively with R&D senior staff in investigating and developing new science and technology areas.
5. Support and maintain the Visiting Scientist Program to select and bring to PM R&D leading technologists whose work may be of value. Encourage and promote the exposure of the technical staff to these individuals.

STRATEGY III.

Coordinate and/or support the "acquisition" of appropriate expertise in science and technology areas of potential importance to the Company.

Tactics:

Strategic areas of science and technology to be developed in-house and/or through external contracts include:

1. New technologies for the production of specialized papers in support of R&D programs. Strategic needs include novel inorganic fillers and specialized adhesives. These developments will involve continued sponsored research at Virginia Tech., the University of Maine and Western Michigan University. (See plans for the Paper Program.)
2. Enhanced understanding of tobacco expansion mechanisms, leading to expanded fillers with improved physical and subjective properties. Strategic needs include means for continuous impregnation and total blend expansion as well as improved fundamental understanding of thermal ("glass transition") behavior. External research programs may be needed. (See plans for the New Expanded Tobacco program.)
3. Technologies for high speed optical inspection of cigarettes and/or novel products.

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4. Fundamental approaches to the high speed characterization of disordered systems (tobacco streams.) Contract research at Carnegie Mellon (Dr. Casasent) is anticipated.
5. New technologies for energy production and storage. Development work is in progress at N.Y. Polytechnic University and Pinnacle Research Institute. A collaborative program with Motorola is anticipated.
6. Better understanding of aerosol formation and aerosol properties. Dr. Schug (Va. Tech.) is continuing fundamental studies of liquid systems. Continued work with Dr. Bernstein (Colorado State) is aimed at basic understanding of the initial condensation of supersaturated systems and at experimental determinations of the effects of salt nuclei.
7. Development and application of knowledge-based "expert systems." Ongoing work in the Computer Applications Division³ includes development of a cigarette design expert system to determine recommended cigarette parameters to meet specified performance goals as well as continuing explorations in the areas of process control, data interpretation, diagnosis, natural language interfaces, machine learning and inductive reasoning.
8. Development of neural computers for mapping and classification applications. Implementations planned by the Computer Applications Division³ include predictors of subjective response from analytical data and of smoking preference from demographic data as well as the classification of electrophysiologial waveforms.
9. Improved understanding of low temperature catalysts for application to smoking products and/or room air purification. Collaboration will continue with Dr. Augustine (Seton Hall University). Contacts will be made with additional university or industrial laboratories that appear to be making significant contributions in this very complex area.
10. Improved separations technology. Efforts will be continued to identify emerging technologies with potential for nicotine or flavor separations.
11. Biodegradable materials. Initial contacts (Battelle) have been made regarding a potentially biodegradable polymer for use in paper or filters. Investigations in this area will be continued as appropriate.
12. Means of environmental smoke abatement. Effort will be continued to identify more effective means of particulate and/or vapor reduction phase ETS in ambient air.

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RESOURCES:

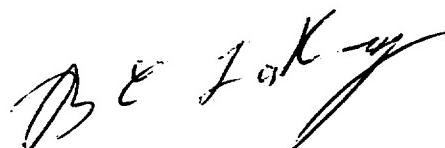
Personnel:

Current Technology Assessment Group personnel are Cliff Lilly, Bernie LaRoy, John Lephardt (on loan from Analytical Research), Henry Merritt, Ted Sanders, and Hazel Stewart (Secretary.)

Dr. Lephardt is currently devoting full time to the PACT program and Dr. Sanders is serving as coordinator of the Paper Program. Mr. Merritt is devoting the bulk of his time to the New Expanded Tobacco Program and to the research program with N.Y. Polytechnic. The addition of a new member (with business and technical degrees) is anticipated in 1990.

References:

1. B. C. LaRoy, "Technology Assessment Status and 1989 Strategies," Memo to A. C. Lilly, February 15, 1989
2. B. C. LaRoy, "Summary of Technology Assessment Discussion at the December, 1989 R&D Planning Meeting," January 1990
3. J. J. Blankenship, "Operational Plan - Application of Expert System and Neural Network Technologies," Memo to A. C. Lilly, February 13, 1990



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